

CLASSIFIED MESSAGE

ORIG :
 UNIT : NPIC/TSSG/TAD
 EXT :
 DATE : 12 JUNE 1968

SECRET

ROUTING

1		4	25X1
2		5	25X1
3		6	25X1

1968 JUN 17 11 35Z

TO : DIA
 FROM : NPIC
 CONF :
 INFO :

PRECEDENCE		DEFERRED		PRIORITY	INITIALS
	X	ROUTINE		OPERATIONAL IMMEDIATE	INITIALS

Declassification Review by NGA

OUT65379

TO DIA INFO

CITE NPIC 4028

ATTENTION:

SUBJECT: RESULTS OF PROCESSING TEST OF GIANT SCALE MISSION SO14

1. GIANT SCALE MISSION SO14 WAS FLOWN AS A PHOTOGRAPHIC PROCESSING TEST ON 11 MAY 1968. THE MATERIALS FROM THE OPTICAL SENSORS WERE PROCESSED IN VARIOUS TYPES OF CHEMISTRY IN AN ATTEMPT TO DETERMINE OPTIMUM PROCESSING FOR THE VARIOUS EMULSIONS. A RECIPROCAL ROUTE WAS FLOWN THAT PROVIDED IDENTICAL COVERAGE FROM THE VARIOUS CAMERA SYSTEMS. THE NEGATIVES RECEIVED THE FOLLOWING PROCESSING:

CHEMISTRY	TECHNICAL OBJECTIVE		OPERATIONAL OBJECTIVE		TERRAIN
	AL FRAMES	AR FRAMES	CL FRAMES	CR FRAMES	
MX-578	718/1598	NONE	NONE	01/996	151/374
G-4	NONE	01/1556	01/903	NONE	01/94*
BRAND-X	01/717	NONE	NONE	NONE	01/150

*THESE FRAMES SHOULD HAVE BEEN TITLED 375 TO 469 AND CONTAIN NO USABLE IMAGERY FOR THIS TEST SINCE ALL ACQUISITIONS WERE OVER WATER. THE TECHNICAL AND TERRAIN OBJECTIVE CAMERAS EMPLOY TYPE 3400 FILM WHICH RESOLVES 65 L/MM AT A 1.6:1 CONTRAST RATIO AND THE OPERATIONAL

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OBJECTIVE CAMERAS EMPLOY TYPE 3404 FILM WHICH RESOLVES 200 L/MM AT
THE SAME CONTRAST RATIO WHEN PROCESSED IN THE SAME CHEMICALS.

2. CLOUDS COVERED LESS THAN 10 PERCENT OF THE IMAGERY AND
HAZE WAS MINIMAL ON THIS MISSION.

3. NPIC/TSSG WAS TASKED TO DETERMINE WHICH CHEMISTRY PROVIDED
THE MOST IN TERMS OF INFORMATION CONTENT. PARTICULAR INTEREST WAS TO
BE GIVEN TO THE HIGHLIGHT AND SHADOW AREAS TO ASCERTAIN IF ONE CHEM-
ISTRY IS SUPERIOR IN EITHER OR BOTH THESE AREAS. TO PERFORM THE
EVALUATION, SIMILAR IMAGERY WAS CHOSEN ON THE TEOC, OOC, AND TROC
CAMERAS. SIX TECHNOLOGISTS MADE COMPARISONS OF SIMILAR IMAGERY FROM
THE SAME OR SIMILAR CAMERAS. EACH OBSERVER SELECTED THE FRAME WHICH
IN HIS JUDGEMENT PROVIDED THE MOST DETAIL IN TERMS OF INFORMATION CONTENT.
THE AESTHETIC QUALITY (MOST PLEASING TO THE EYE) OF THE IMAGERY WAS NOT
A PRIMARY CONSIDERATION. ONLY THE NEGATIVES WERE USED FOR THIS TEST.
THE OBSERVER INDICATED WHICH FRAME IF ANY, WAS SUPERIOR. THE FOLLOWING
TABLES LIST THE FRAMES CHOSEN FOR COMPARISON, THE CRITICAL DATA PER-
TAINING TO EACH FRAME, AND THE NUMBER OF TIMES THAT FRAME WAS PREFERRED

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IN THE TEST.

THE DIFFERENCES IN ALTITUDE AND OBLIQUITY WERE MINIMAL AND ARE NOT CONSIDERED TO BE A FACTOR IN THE COMPARISON.

A. CAMERA - OPERATIONAL OBJECTIVE (CL AND CR)

<u>COMPARISON</u>	<u>CAM.</u>	<u>FR.</u>	<u>ALT. FEET</u>	<u>PROCESS</u>	<u>NUMBER OF TIMES SELECTED AS BEST</u>
1	CR	41	76,800	MX578	4
1	CL	763	78,000	G4-L	2
2	CR	41	76,800	MX578	6
2	CR	818	78,000	MX 578	0
3	CR	43	76,800	MX578	1
3	CL	42	76,800	G4-L EQUAL	3 2
4	CR	43	76,800	MX578	3
4	CR	818	78,000	MX578	3
5	CR	818	78,000	MX578	0
5	CL	42	76,800	G4-L	6
6	CR	84	77,200	MX578	6

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COMPARISON CAM. FR. ALT. FEET PROCESS NUMBER OF TIMES
SELECTED AS BEST

6	CL	726	78,000	G4-L	0
7	CR	187	78,000	MX578	6
7	CL	626	77,100	G4-L	0
8	CR	219	78,200	MX578	6
8	CL	594	76,900	G4-L	0
9	CR	219	78,200	MX578	6
9	CL	596	77,000	G4-L	0
10	CR	305	78,600	MX578	4
10	CL	510	76,500	G4-L EQUAL	1
11	CR	670	77,000	MX578	2
11	CL	176	78,100	G4-L EQUAL	3 1
12	CR	766	78,000	MX578	1
12	CL	88	77,400	G4-L EQUAL	2 3
13	CR	780	78,000	MX578	5
13	CL	76	77,200	G4-L	1

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TO	COMPARISON	CAM.	FR.	INFO ALT. FEET	PROCESS	CITE
						NUMBER OF TIMES SELECTED AS BEST
	14	CR.	782	78,000	MX578	3
	14	CL.	76	77,200	G4-L	2
					EQUAL	1

CAMERA - TECHNICAL OBJECTIVE (AL AND AR)

COMPARISON	CAM.	FR.	ALT. FEET	OBLIQ. DEGREES	PROCESS	NO. OF TIMES SELECTED AS BEST
1	AL	19	76,800	0.0	793-2	6
1	AR	1304	78,000	5.3	G4-L	0
2	AL	19	76,800	0.0	793-2	0
2	AR	25	76,800	1.2	G4-L	6
3	AL	19	76,800	0.0	793-2	2
3	AL	1322	78,000	-0.2	G4-L	3
					EQUAL	1
4	AL	20	76,800	8.2	793-2	5
4	AL	1322	78,000	-0.2	MX578	1
5	AL	20	76,800	8.2	793-2	4
5	AL	1324	78,000	-0.2	MX578	1
					EQUAL	1

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COMPARISON CAM. FR. ALT. FEET OBLIQ. DEGREES PROCESS NO. OF TIMES
SELECTED AS
BEST

6	AL	20	76,800	8.2	793-2	0
6	AR	24	76,800	9.5	G4-L EQUAL	5 1
7	AL	1324	78,000	-0.2	MX578	0
7	AR	24	76,800	9.5	G4-L	6
8	AR	25	76,800	1.2	G4-L	6
8	AR	1304	78,000	5.3	G4-L	0
9	AL	98	77,200	8.2	793-2	0
9	AR	108	77,200	9.5	G4-L	6
10	AL	392	78,400	-17.6	793-2	6
10	AR	966	77,000	25.4	G4-L	0
11	AL	549	78,800	-41.9	793-2	6
11	AR	766	76,600	42.0	G4-L	0
12	AL	632	78,900	4.6	793-2	5
12	AR	617	78,900	2.2	G4-L EQUAL	0 1

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TO	COMPARISON	CAM.	FR.	INFO ALT. FEET	OBLIQ. DEGREES	PROCESS	CITE NO. OF TIMES SELECTED AS BEST
	13	AL	632	78,900	4.6	793-2	6
	13	AR	690	76,300	4.8	G4-L	0
	14	AR	617	78,900	2.2	G4-L	6
	14	AR	690	76,300	4.8	G4-L	0
	15	AL	742	76,500	-1.2	MX578	
	15	AR	727	76,500	-3.5	G4-L EQUAL	3 3
	16	AL	822	76,800	-40.3	MX578	3
	16	AR	513	78,600	40.8	G4-L EQUAL	1 2
	17	AL	880	76,900	-18.6	MX578	0
	17	AR	458	78,500	23.3	G4-L	6
	18	AL	1109	77,700	-48.5	MX578	6
	18	AR	234	78,000	49.0	G4-L	0
	19	AL	1220	77,800	-35.0	MX578	0
	19	AR	122	77,300	37.2	G4-L	6

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C. CAMERA - TERRAIN OBJECTIVE (B)

COMPARISON	CAM.	FR.	ALT. FEET	FR. OBLIQ.	PROCESS	NO. OF TIMES SELECTED AS BEST
1	B	115	76,800	VER.*	793-2	4
1	B	358	78,000	VER.	MX578 EQUAL	1 1
2	B	115	76,800	VER.	793-2	6
2	B	359	78,000	VER.	MX578	0
3	B	358	78,000	VER.	MX578	4
3	B	359	78,000	VER.	MX578 EQUAL	1 1
4	B	119	77,300	VER.	793-2	5
4	B	354	77,800	VER.	MX578	1

* VERTICAL

4. BASIC IMAGE QUALITY DIFFERENCES ASSOCIATED WITH CAMERA PERFORMANCE, PRECLUDE ANY ABSOLUTE CONCLUSIONS, RELATIVE TO PROCESSING CHEMISTRY PREFERENCE.

5. GENERAL OBSERVATIONS INDICATE THAT THERE IS NO SIGNIFICANT

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DIFFERENCE IN INFORMATION CONTENT THAT CAN BE DIRECTLY ATTRIBUTED TO THE PROCESSING. DETAIL IN THE HIGHLIGHT AND SHADOW AREAS DOES NOT APPEAR TO BE INFLUENCED BY THE CHEMISTRY. THE EXPOSURE AND PROCESSING OF ALL THE MATERIAL APPEARS SOMEWHAT SUPERIOR TO PREVIOUS MISSIONS. THE STATISTICAL DATA INCLUDED IN THIS REPORT IS REQUESTED BY [] AND MAY BE USED BY THE DIA FOR FURTHER ANALYSIS.

25X1

6. EVALUATION OF THE REPRODUCTIONS ARE NOT INCLUDED AS PART OF THIS REPORT SINCE IT BECAME OBVIOUS DURING THE EVALUATION OF THE NEGATIVES THAT MEANINGFUL CONCLUSIONS COULD NOT BE DERIVED BECAUSE OF THE CAMERA INDUCED DEGRADATIONS.

7. IF A SIMILAR TEST IS CONDUCTED, IT IS RECOMMENDED THAT THE FOLLOWING CRITERIA BE USED IF POSSIBLE:

- A. FLY A RECIPROCAL ROUTE ALONG THE SOLAR AZIMUTH.
- B. MAINTAIN A CONSTANT EXPOSURE FOR THE EMULSIONS USED.

DO NOT MODIFY THE EXPOSURE TO COMPENSATE FOR PROCESSING.

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C. SLIT THE 9.5 INCH MATERIAL, BOTH THE TECHNICAL AND TERRAIN, INTO THREE PARTS. THE CENTER SECTION SHOULD BE 70 MM WIDE AND THE TWO OUTSIDE SECTIONS SHOULD BE APPROXIMATELY 79 MM WIDE. ASSUMING THE MISSION TO CONTAIN 1,500 TECHNICAL OBJECTIVE FRAMES:

(1) THE FIRST 500 FRAMES OF THE CENTER SECTION OF THE SLIT MATERIAL SHOULD BE PROCESSED IN MX-578. THE SECOND 500 FRAMES IN G-4 CHEMISTRY AND THE LAST 500 FRAMES IN BRAND-X.

(2) THE FIRST 500 FRAMES OF THE SLIT MATERIAL THAT NORMALLY CONTAINS THE TITLED EDGE SHOULD BE PROCESSED IN G-4. THE SECOND 500 FRAMES IN BRAND-X AND THE LAST 500 FRAMES IN MX-578.

(3) THE FIRST 500 FRAMES OF THE SLIT MATERIAL THAT NORMALLY CONTAINS THE UNTITLED EDGE SHOULD BE PROCESSED IN BRAND-X. THE SECOND 500 FRAMES IN MX-578 AND THE LAST 500 FRAMES IN G-4. SUCH A PROCEDURE WILL MINIMIZE CAMERA OR

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VEHICLE DEGRADATIONS AS WELL AS OTHER ENVIRONMENTAL
CHANGES THAT THE SYSTEM MAY BE SUBJECTED TO FROM IN-
FLUENCING THE RESULTS OF THE PROCESSING ANALYSIS.

(4) MAKE ALL REPRODUCTIONS ON 70 MM PRINT STOCK.

REPRODUCTION OF THE TWO OUTSIDE SECTIONS SHOULD PROVIDE
IMAGERY ADJACENT TO THE CENTER SECTION WITH NO TITLED OR
UNTITLED EDGES ON THE REPRODUCTION. THE HEAD AND TAIL
IDENTS CAN IDENTIFY THE INCLUSIVE FRAME NUMBERS AND NO
TITLING WILL BE REQUIRED.

D. IT IS IMPRACTICAL TO SLIT THE 70 MM MATERIAL FROM THE
OPERATIONAL OBJECTIVE CAMERA SYSTEMS; IT IS THEREFORE SUGGESTED
THAT THE CHEMISTRY BE CHANGED EVERY 100 FRAMES THUS PROVIDING
SUFFICIENT VARIATIONS IN PROCESSING THROUGHOUT THE MISSION.

- END OF MESSAGE -

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Chief, NPIC/TSSG
RELEASING OFFICER

CHIEF, TAD/TSSG/NPIC
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